ASPECTS OF ENERGY POVERTY IN EU28 COUNTRIES

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ABSTRACT

Energy poverty is affecting an increasing number of households across the EU, a fact reflected in recent European and national legislation. The EU has not developed a common definition of energy poverty yet, while policies among member states vary considerably. This study examines the factors that are related to energy poverty across the EU countries, based on EUROSTAT data for the year 2018, in order to provide an in-depth understanding of the phenomenon, as well as to look for the common denominator for member states that have the biggest problem. In addition, the paper aims to critically examine the definition of energy poverty as well as possible indicators that determine the vulnerability of EU households in the future. According to this study, energy poverty is positively related to risk of poverty, unemployment rates and the Gini coefficient, while it is negatively related to per capita GDP. Moreover, it is positively related to high rates of household occupancy and poor housing conditions, but not to the housing cost itself. Furthermore, it is positively related to gas and electricity prices, as well as to the dependency on energy imports. Overall, the member states of Northern, Western and Central Europe appear to be less affected by energy poverty, compared to the member states of South and South-eastern Europe. The existing discrepancies are not necessarily reflected in the above factors, indicating that energy poverty is also affected by complicated geospatial conditions.

KEYWORDS

energy policy, energy poverty, energy vulnerability

1. INTRODUCTION

Energy poverty is a global social and economic issue, as about 1.2 billion people have no access to electricity and 2.8 billion do not have access to clean cooking facilities, and affects an increasing number of households across the world, both in the developed countries and in developing regions. [21] During the recent years, this fact has been gradually recognized and reflected in the European and national legislation. However, EU has not developed a common definition of energy poverty yet, while the way each country attempts to deal with it varies considerably. [3]

This study attempts to fill this gap by approaching energy poverty at EU level through a comparative analysis of the indicators linked to this phenomenon.

2. METHODOLOGY

For the research, initially, a literature review was conducted. Eurostat data for the year 2018 on various sectors linked to energy poverty across the EU such as revenue, building stock quality, energy prices, etc. were then retrieved. The data were entered into Microsoft Excel in conjunction with statistics on the energy- poor population and exported in the form of charts

to identify the positive or negative correlation. Especially for this study, energy poverty is defined as the inability to keep the home adequately warm and this is the main indicator of comparison with other indicators. The Y- axis of each chart refers to the energy- poor population while the X-axis refers to each sector linked to energy poverty.

3. RESULTS AND DISCUSSION

3.1 Energy Poverty

3.1.1 The phenomenon of energy poverty

Energy poverty is widely defined as the insufficient access to basic energy services.[2-7-12] It is the outcome of the combination of social, economic and local factors and it is closely related to income poverty. The estimation of energy poverty is a complicated procedure concerning directly measurable factors, approximate numbers and subjective factors, while it is differentiated depending on the region and the field of study. The difficulty of measurement in European level is intensified by the absence of an admittedly common definition. On a EU level, attempts to deal with energy poverty began in 2009 with the Clean Energy Package and it has been reflected on various legislations and policies developed afterwards, combined with the issue of climate change.

3.1.2 Basic causes of energy poverty

The phenomenon of energy poverty is mostly attributed to the combination of three basic factors: the low household income, the energy inefficient housing and the increasing cost of energy.[10,15,18] Additional factors that contribute to this phenomenon are the increasing energy needs of specific households (extended families, handicapped people.), partial social-demographic characteristics and characteristics of residential surroundings.[5]

3.1.3 Consequences of energy poverty

In social level, energy poverty complicates greatly the living conditions, influences public health (thermal drift, poor ventilation etc) directly or indirectly (harmful particles in the atmosphere because of heating). The inevitable deterioration of human conditions had psychological effects as well.

In financial level, the increasing morbidity leads to the increase of operational expenses of the national health care system[13,15] as well as the inability of households to cover financial issues.

As far as the environment is concerned, the tendency to cheaper forms of energy such as biomass, means the emission of particles which contribute to climate change. Moreover, the use of biomass contributes to deforestation and soil degradation.

3.1.4 Energy vulnerability

Energy vulnerability describes a sum of factors that are able to lead to energy poverty,[1,8] like limited access to energy, limited access to affordable energy, limited flexibility in terms of choice of energy supplier, energy inefficient homes, special needs of each household, etc.

3.1.5 Energy justice-Energy democracy

Enery justice comes to terms with three partial forms of inequality which contribute to energy poverty: unequal distribution of energy access among social groups, inequality of legislation regarding the energy distribution and inequality of identification of different needs of different social groups.

Energy democracy comes to terms with a social movement which aims at a drift of international energy policy towards the exploitation of renewable energy sources in combination with policies that enhance social justice.

3.2 Approach of energy poverty in European countries

3.2.1 Definitions of energy poverty

The initial step to address energy poverty is the definition of the term in national level, nevertheless, only specific countries-members have given their own definitions. Moreover, the already existing definitions vary.

3.2.2 Definitions of vulnerable consumer

The definitions of vulnerable consumer can be put in four categories[16,19] according to the provision of social welfare assistance, the financial energy

access, the existence of health issues or special needs and according to social and financial criteria. This is a results and discussion paragraph.

By and large, there are two categories of policies for handling this phenomenon. The first one focuses on the social policy, accepting the low income and poverty as the main causes of energy vulnerability. The second one, considers energy poverty as a separate issue of energy policy addressing the ministry of energy.

3.2.3 Indicators of measurement of energy poverty

The approach of the phenomenon of energy poverty is tried through three basic methods of measurement of this phenomenon: expenditure approach, consensual/subjective approach and direct measurement through the comparison of levels of energy sources that a household is able to consume with a pre-defined level.[19] This is a results and discussion paragraph.

3.2.4 Policies & Measures to address energy poverty

Nationally, the fundamental measures can be categorized in three groups: the interventions in the existing building stock, the informative and advisable interventions and the interventions of financial and legislative support.

3.3 Comparative analysis of individual factors of the energy poverty in EU28

3.3.1 Energy poverty, risk of poverty, Gini coefficient

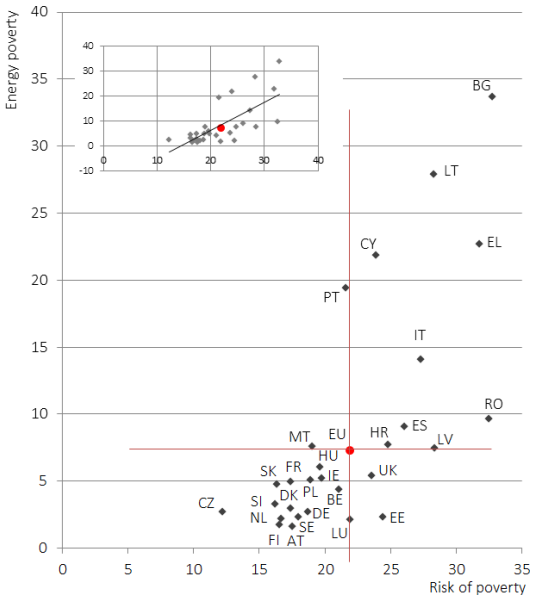

Figure 1. Share of population at risk of poverty or social exclusion - Share of population in energy poverty. Source: Eurostat (online data codes: ilc_peps01, ilc_mdes01)

Energy poverty is positively related to risk of poverty and Gini coefficient. Gini coefficient represents the income inequality or wealth inequality within the inhabitants of a country, indicating that those two contributes to the deterioration of the problem.

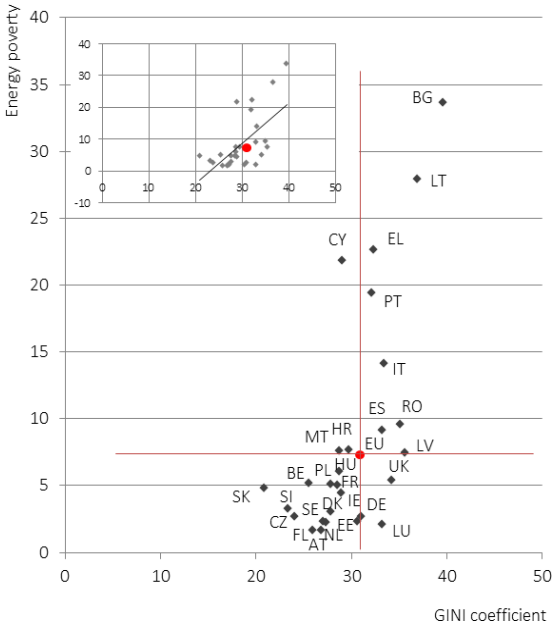

Figure 2. GINI coefficient - Share of population in energy poverty. Source: Eurostat (online data codes: ilc_di12, ilc_mdes01)

3.3.2 Energy poverty and GDP per capita

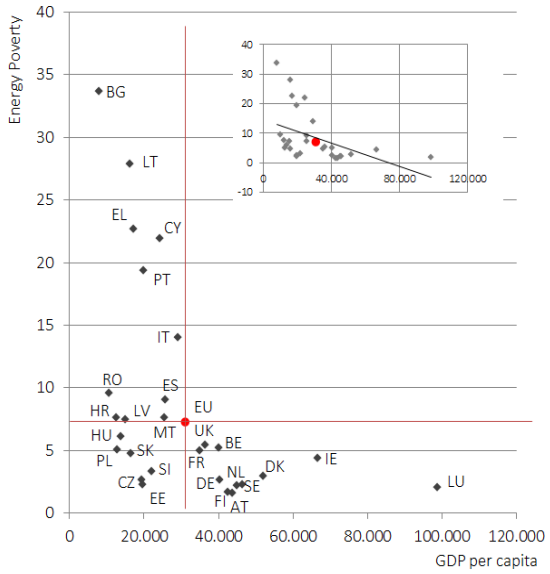

Figure 3. GDP per capita - Share of population in energy poverty. Source: Eurostat (online data codes: nama_10_pc, ilc_mdes01)

Energy poverty is negatively related to GDP per capita. This is especially true for member states of Southern and Southeastern Europe, as a result of lower housing quality, tenure status, access to infrastructure and energy privatization. No country with a high GDP per capita has energy poverty rates above the European average.

3.3.3 Energy poverty, unemployment, arrears on utility bills

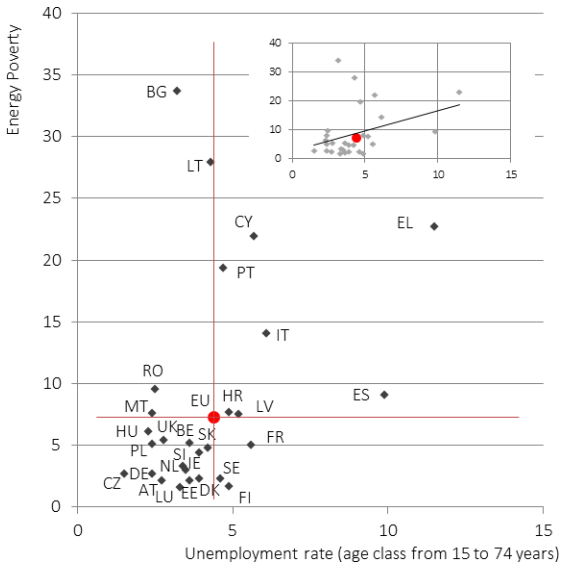

Figure 4. Unemployment rate - Share of population in energy poverty. Source: Eurostat (online data codes: TPS00203, ilc_mdes01)

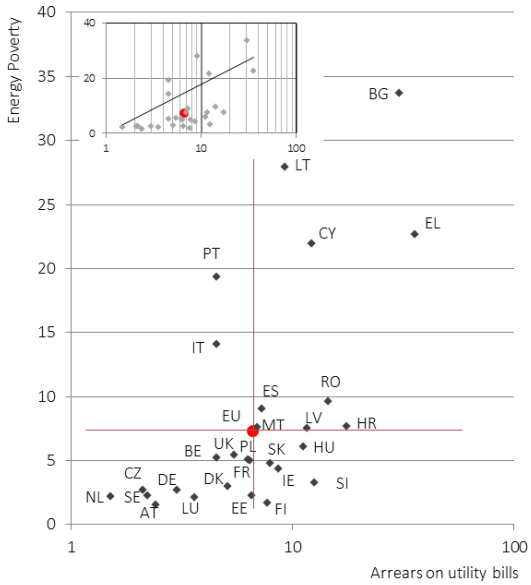

Figure 5. Arrears on utility bills - Share of population in energy poverty. Source: Eurostat (online data codes: ilc_mdes07, ilc_mdes01)

In EU countries high rates of unemployment are related to high rates of energy poverty. This is particularly evident in southern and southeastern member states. Arrears on utility bills is a key indicator of energy poverty. Furthermore energy poverty is positively related to mean equivalised net income.

3.3.4 Energy poverty, health and nutritional poverty

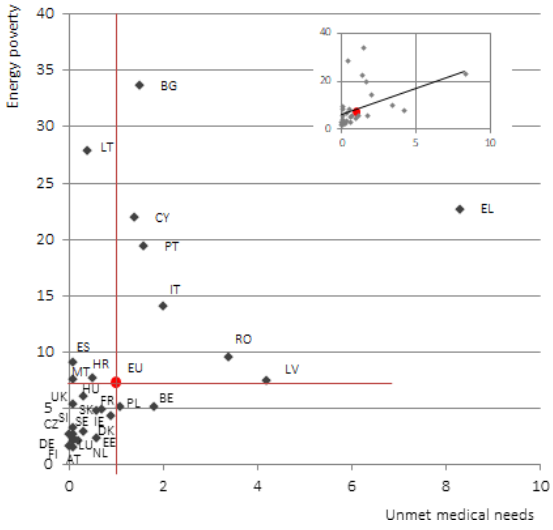

Figure 6. Share of population having unmet medical needs - Share of population in energy poverty. Source: Eurostat (online data codes: hlth_silc_08, ilc_mdes01)

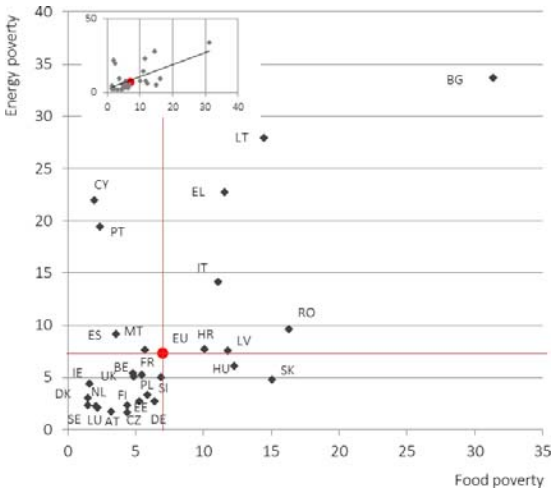

Figure 7. Share of population in food poverty - Share of population in energy poverty. Source: Eurostat (online data codes: ilc_mdes03, ilc_mdes01)

Energy poverty often coincides with food poverty, which occurs when households are forced to sacrifice one essential good to purchase another. Southeast European countries have high rates of food and energy poverty. However, there are discrepancies which are probably related to the high productivity of these countries and the predominance of the Mediterranean diet. Energy poverty is also positive related to unmet medical needs due to cost.

3.3.5 Energy poverty, severe housing deprivation and housing costs

The existing building stock is insufficient, based on current requirements, and as a result vulnerable people are living in poor quality housing.

Energy poverty is positively related to the existence of housing deprivation. In addition, high levels of the phenomenon are also observed in member states with poor housing conditions.

Furthermore energy poverty is positively related to the share of housing costs in disposable household income, although there are significant discrepancies in this condition.

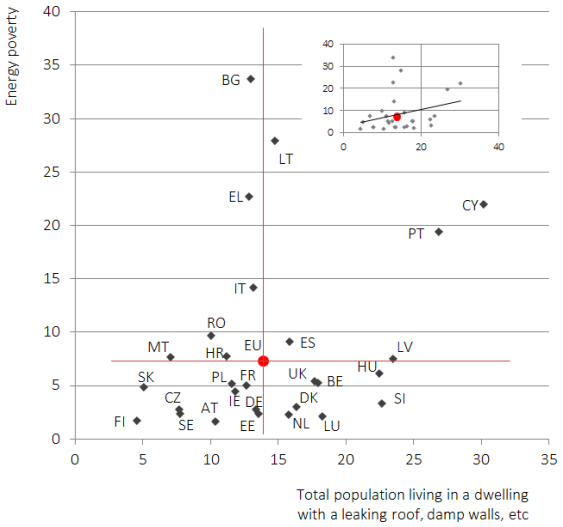

Figure 8. Total population living in a dwelling with damp walls, etc - Share of population in energy poverty. Source: Eurostat (online data codes: ilc_mdho06a, ilc_mdes01)

3.3.6 Energy poverty, energy production and imports, energy prices

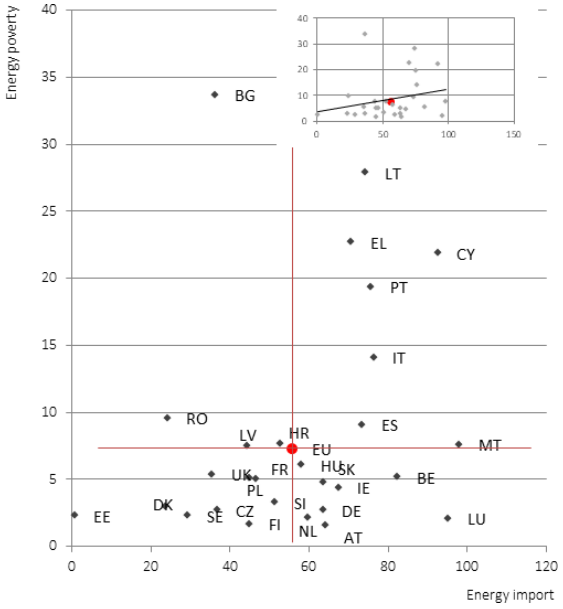

Figure 9. Energy import - Share of population in energy poverty. Source: Eurostat (online data codes: nrg_ind_id, ilc_mdes01)

European Union (EU) depends on oil and natural gas imports, which has a direct impact on energy tariffs. Energy price increases since the mid-1990s are closely linked to the general prevalence of neoliberal policies and the trend towards privatization of public utilities,[9] although the goal was to make energy cost-competitive and to reduce cost. Furthermore increasing carbon prices caused by the European Union Emissions Trading System

burdening the final consumers.

In 2018, energy imports increased, as wells as the energy dependency rate reaching approximately 55.7%.

Energy poverty is positively related to energy imports in half of the EU member states.

3.3.7 Energy poverty, electricity and gas prices for household consumers

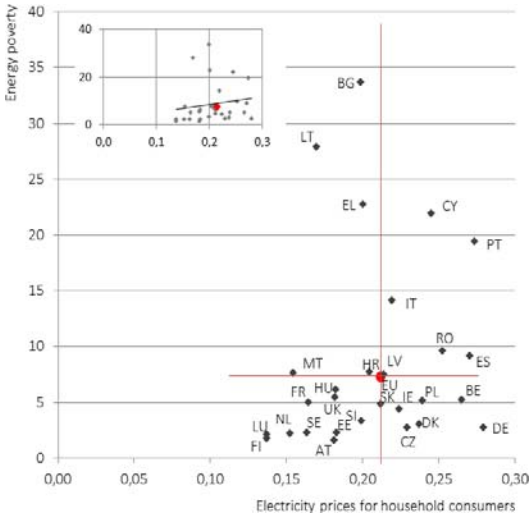

Figure 10. Electricity prices for household consumers - Share of population in energy poverty. Source: Eurostat (online data codes: ilc_mdes07, ilc_mdes01)

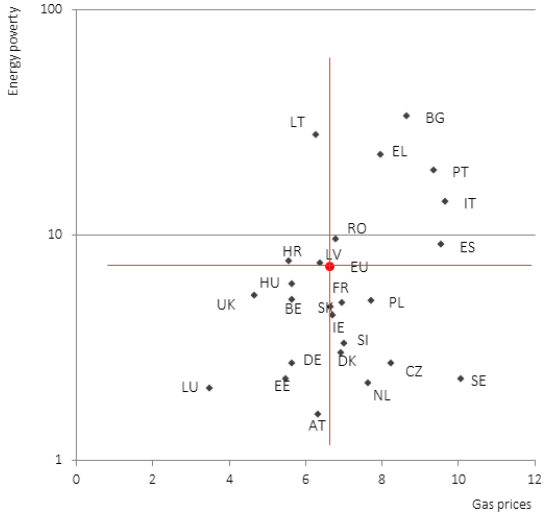

Figure 11. Gas prices for household consumers - Share of population in energy poverty. Source: Eurostat (online data codes: nrg_pc_202, ilc_mdes01)

Energy poverty is positively related to electricity prices, although there are some discrepancies. Member states with the largest decrease in electricity prices, have a simultaneous reduction of the phenomenon. It is also observed that in the countries with the highest rates of energy poverty, taxes occupy a large part of the total price of electricity.

Concerning gas prices, most southern and eastern European member states have high rates of energy poverty and high gas prices compared to the European price.

Finally, either electricity or gas prices, or both have risen above the European average in most periphery countries.

3.3.8 Energy poverty and general government expenditure by function

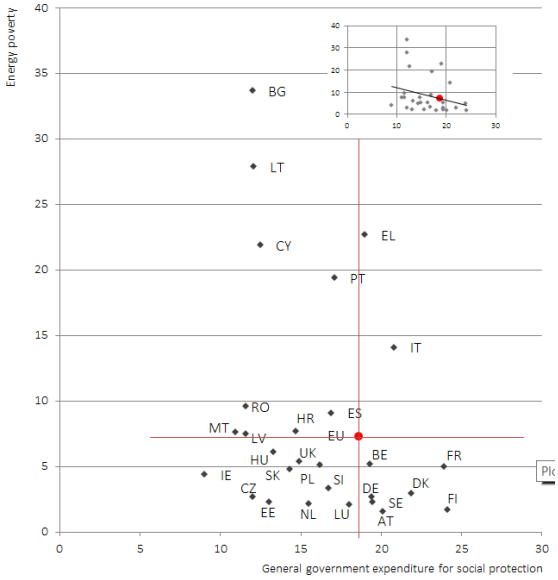

Figure 12. General government expenditure on social protection - Share of population in energy poverty. Source: Eurostat (online data codes: gov_10a_exp, ilc_mdes01)

An immediate action for many governments is to provide benefits to vulnerable consumers. However, this is a short-term policy and does not encourage the development of energy efficiency policies, which are a more effective long- term solution. The vast majority of countries, which have allocated a percentage of their total GDP below the EU average for total general government expenditure, have high rates of energy poverty. It is also observed that in southern member states with high rates of energy poverty, a lower percentage than the EU average of their GDP was spent on social protection and housing subsidies.

4. CONCLUSIONS

Member states of South East Europe report very low incomes, energy prices close to the European average and very high energy poverty rates.

In addition, member states of Southern Europe also face a significant problem.

Northern European member states have the lowest levels of energy poverty and the highest incomes, while energy prices are lower than the European average.

Significant discrepancies are observed in Central Europe. Energy poverty rates remain below the European average, but the countries with the highest per capita GDP have significantly lower energy poverty rates.

Overall, the member states of Northern, Western and Central Europe appear to be less affected by energy poverty, compared to the member states of South and South-eastern Europe. The existing discrepancies are not necessarily reflected in the above factors, indicating that energy poverty is also affected by complicated geospatial conditions.

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